In the Claims

1. (currently amended) Luminescent silica gel particles containing a transparent silica gel matrix, said transparent silica gel matrix ~~which contain one or more~~ having at least one luminescent substance, ~~substances in a transparent silica gel matrix and~~ said particles exhibiting at least one property selected from the group consisting of ~~exhibit at least one of the properties set out below~~:

[[a)]] the ~~particle~~ size of said particles being [[is]] at least 0.5 μm;

[[b)]] said at least one [[the]] luminescent substance of said particles ~~substance(s) is/are~~ being selected from the group consisting of luminescent organic compounds, up-converting phosphors and luminescent proteins;

[[c)]] said particles containing ~~they additionally contain~~ a magnetic colloid; and

[[d)]] said [[the]] silica gel matrix of said particles including [[has]] functional groups which can be coupled with biomolecules.

2. (currently amended) Particles according to Claim 1, ~~characterized in that they~~ wherein said particles are not self-fluorescent.

3. (currently amended) Particles according to Claim 1, wherein ~~or 2, characterized in that the~~ said at least one luminescent substance is ~~substance(s) are~~ encapsulated in said [[the]] particles.

4. (currently amended) Particles according to claim 1, wherein ~~in accordance with any one of the preceding Claims, characterized in that the~~ said at least one luminescent substance displays ~~substance(s) is/are selected from the group of substances~~ an energy transfer selected from the group consisting of ~~which display a~~ fluorescence, phosphorescence, chemoluminescence, electroluminescence [[or a]] and luminescence ~~energy transfer~~.

5. (currently amended) Particles according to claim 1, wherein ~~in accordance with any one of the preceding claims, characterized in that~~ the concentration of [[the]] said at least one luminescent substance ~~substances~~ is 1 to 10%-wt.

6. (currently amended) Particles according to claim 1, wherein said at least one luminescent substance has an emission frequency and wherein any two of said at least one ~~in accordance with any one of the preceding claims, characterized in that the~~ luminescent substance ~~substances~~ display different emission frequencies.

7. (currently amended) Particles ~~in accordance with any one of the preceding claims, characterized in that the~~ according to claim 1, wherein said at least one luminescent

substance is a molecule having an excitation frequency and an emission frequency, and wherein ~~substances are molecules whose~~ said excitation frequency is higher than said [[the]] emission frequency.

8. (currently amended) Particles ~~in accordance with any one of Claims 1 to 6, characterized in that the~~ according to claim 1, wherein said at least one luminescent substance consists ~~substances consist~~ of semiconductor nanocrystals formed from elements selected from the groups of the periodic system consisting of [[the]] Group IIIA, Group [[and]] VA, Group IIB, [[and]] Group VIA [[or]] and Group IVA.

9. (currently amended) Particles according to ~~in accordance with~~ Claim 8, wherein ~~characterized in that the~~ said luminescent semiconductor nanocrystals are doped with at least one of copper ~~and/or~~ or silver additives.

10. (currently amended) Particles according to claim 1, wherein ~~in accordance with one of Claims 1 to 6, characterized in that the~~ said at least one luminescent substance ~~substances have~~ has an excitation frequency and an emission frequency and wherein said excitation frequency ~~frequencies that are~~ is lower than said [[the]] emission frequency ~~frequencies~~.

11. (currently amended) Particles according to ~~in accordance with~~ Claim 10, ~~characterized in that the~~ wherein said at least one luminescent substance ~~substances are~~ is a microcrystalline compound ~~compounds~~ selected from the group consisting of rare earths and ~~and/or~~ yttrium having at least one element ~~with elements~~ from the Group VIA ~~and/or~~ or the Group VIIA.

12. (currently amended) Particles ~~in accordance with any one of the preceding Claims, characterized in that the~~ according to claim 1, wherein said at least one luminescent substance ~~substances are~~ is a metal-chelate compound having a central atom, said ~~compounds whose~~ central atom ~~has been chosen~~ being selected from the group of the periodic system consisting of Group VIII, Group IB, Group IIB and ~~or the group of~~ rare earths.

13. (currently amended) Particles ~~in accordance with any one of the preceding Claims, characterized in that the~~ according to claim 1, wherein said at least one luminescent substance ~~substances are~~ is a pyrrole dye [[dyes]].

14. (currently amended) Particles according to claim 1, wherein said ~~in accordance with Claims 1 to 6, characterized in that the~~ luminescent substance is a ~~substances are~~ luminescent protein ~~proteins~~.

15. (currently amended) Luminescent polymer particles comprising:

a transparent silica gel matrix;

at least one luminescent substance in said transparent silica gel matrix; and

~~in accordance with any one of Claims 1 to 14 in which, in addition,~~ a magnetic colloid ~~is contained or has been encapsulated~~.

16. (currently amended) Particles according to ~~in accordance with~~ Claim 15, ~~characterized in that the~~ wherein said magnetic colloid is selected from the group comprising ferro-magnetic compounds, ferri-magnetic compounds, [[and]] superparamagnetic compounds and ferrofluids.

17. (currently amended) Particles ~~in accordance with Claim 15 or 16, characterized in that the~~ according to claim 15, wherein said magnetic colloid is present in a concentration of 10-50% by weight relative to the polymer particle.

18. (currently amended) Particles according to claim 1, ~~in accordance with any one of the preceding Claims, characterized in that the~~ wherein said silica gels have functional groups that can be coupled to at least one biomolecule ~~biomolecules~~, said at least one biomolecule being selected from the group consisting of ~~comprising~~ proteins, peptides, cell receptors, nucleic acids, nucleic acid fragments, polysaccharides, oligosaccharides, antibodies, antibody-fragments, streptavidin, avidin, biotin and enzymes~~, or that are coupled to one or more of such biomolecules~~.

19. (currently amended) A process ~~Process~~ for the production of luminescent silica gel particles which contain a transparent silica gel matrix having at least one ~~or more~~ luminescent substance ~~substances~~ in said ~~a transparent~~ silica gel ~~matrix~~ particles, said process comprising the steps of: ~~more particularly for the production of luminescent silica gel particles according to any one of Claims 1 to 18, characterized in that~~

[[a)]] condensing a mixture consisting of a diluted acid and alkoxysilanes ~~is condensed~~ to a clear silica sol;[[,]]

[[b)]] homogenously mixing the clear silica sol ~~is homogeneously mixed~~ with at least one ~~or more~~ luminescent substance to form a sol-luminescence substance mixture; ~~substances,~~

[[c)]] dispersing the sol-luminescence substance mixture ~~is dispersed~~ in an organic phase that is not miscible with water; and

[[d)]] adding a base to the sol-luminescence substance mixture ~~is cross-linked~~ during or after said dispersing step in order to cross-link said sol-luminescence substance mixture ~~dispersion by adding a base~~.

20. (canceled)

21. (currently amended) The process according to claim 19, wherein said ~~Process for the production of luminescent silica gel particles in accordance with Claims 19 and 20, characterized in that the~~ organic phase that is not miscible with water contains at least one ~~or more~~ surfactive substance ~~substances~~ in a concentration of 0.1 to 15 % by volume

22. (currently amended) The process according to claim 19, wherein ~~Process for the production of luminescent silica gel particles in accordance with any one of Claims 19 to 21, characterized in that~~ the volume ratio of sol to organic phase is 1:5 to 1:30.

23. (currently amended) The process according to claim 19, wherein ~~Process for the production of luminescent silica gel particles in accordance with any one of Claims 19 to 22, characterized in that the dispersion cross-linking process takes~~ said dispersing and cross-linking steps have a duration of 2 to 30 seconds.

24. (canceled)

25. (currently amended) ~~Use of~~ A sensor for array technology or for nucleic acid sequencing comprising luminescent silica gel particles containing a transparent silica gel matrix and at least one ~~or more~~ luminescent substance ~~substances~~ in said [[a]] transparent silica gel matrix, ~~more particularly the use of luminescent silica gel particles according to any one of Claims 1 to 18 or of silica gel particles produced according to any one of claims 19 to 24,~~ for at least one of the analysis or ~~and/or~~ diagnostic testing of nucleic acids, nucleic acid fragments, proteins, peptides, antibodies, antibody fragments, cells, cell receptors[[,]] and biotinylated biomolecules and [[for]] testing protein or nucleic acid libraries~~, as sensors in the context of array technology or for nucleic acid sequencing~~.

26. (new) The process according to claim 19 and further comprising the step of adding a substance selected from the group consisting of a ferro-magnetic substance, a ferri-magnetic substance and a superparamagnetic substance to the sol-luminescence substance mixture in an amount of 10-50% by weight.

27. (new) The process according to claim 19, and further including the step of mixing an aqueous solution of organic polymer, a polysaccharide or a protein in an amount of 1-20% by volume with the sol before said dispersing step.